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EXAMINER

GARCIA OTERO, EDUARDO

ART UNIT

PAPER NUMBER

2123

DATE MAILED: 12/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/333,379

Applicant(s)

HAGENBUCH ET AL.

Examiner

Eduardo Garcia-Otero

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 18-26, 28-37, 39-53 and 55-59 is/are rejected.
- 7) ☒ Claim(s) 17, 27, 38 and 54 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 12/4/02 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION: Final Action (second office action on the merits)

Introduction

1. Title is: PROCESS FOR THREE-DIMENSIONAL MODELING AND DESIGN OF OFF-HIGHWAY DUMP BODIES
2. First named Inventor is: HABENBUCH
3. Claims 1-59 are pending.

Applicant's REMARKS

4. INTERVIEW OF NOVEMBER 25, 2002.
5. The Examiner thanks the Applicant and his Attorney for the very educational interview. The Applicant demonstrated a scaled loading procedure using scale model trucks. The angles of repose of the load were demonstrated to be non-uniform, using a scale truck of approximately 10 inches in length and using a load material consisting of a particulate material similar to cat litter. Additionally, the Applicant submitted a paper titled "Adapting the off-highway truck", (c) 2000-01-52. This is mentioned in the interview summary and contained in the file.
6. The Examiner requests a black and white copy of the color transparencies that were discussed during the interview, in order to make the record more complete. These contained substantial material information, particularly the measured angles of repose varying from site to site.
7. DRAWINGS NOT DESIGNATED AS PRIOR ART OBJECTION--WITHDRAWN.
8. In view of Applicant's persuasive assertions, this objection is withdrawn.
9. COLORED DRAWINGS OBJECTION--WITHDRAWN.

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10. Applicant has replaced (amended) the colored drawings with black and white drawings.

These amended drawings are accepted and this objection is withdrawn.

11. TERM CORNER VOID—WITHDRAWN.

12. At Remarks, page 16, Applicant adequately explains and defines the term “corner void”.

Thus, the related objections and rejections are withdrawn. The related request for additional drawings is also withdrawn.

13. CLAIM 1, 103 REJECTION—LEGAL PRECEDENT

14. Applicant unpersuasively asserts that “the prior art teaches making a generic dump body for every application”, and quotes the Caterpillar brochure as using a single heaped load pattern based on “continuous analysis of actual weight studies”.

15. It is important to note the complete quotation Caterpillar Inc., Product Division, Field

Representative Information Release, N149F “769 Series B Truck,” 08/24/66, Page 6 first full paragraph “**While field weight distribution will vary, depending upon loading techniques and material characteristics**, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B.” Thus, Caterpillar clearly discloses that field weight distribution varies based on loading techniques and material characteristics. Applicant correctly points out that Claim 1 is distinguishable by using data collected from a single anticipated point of use, rather than Caterpillar’s apparently conglomerated data from multiple points of use.

16. Thus, Claim 1 differs from Caterpillar merely in the size of the group of data used to design the body. *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states

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“mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled”. See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to design bodies at individual points of use, but this does not appear to be patentable.

17. The previous rejection of Claim 1 was inadequate because it did not contain this discussion of scaling. The rejection to Claim 1 (amended) will include this above discussion of legal precedent.

18. NEW CLAIMS 39 AND 52

19. These new claims will be addressed below.

20. SIGNIFICANT COMMERCIAL SUCCESS (SECONDARY CONSIDERATIONS)

21. Applicant notes the significant commercial success of the invention, stating that Philippi-Hagenbuch (assignee) has sold approximately 60 dump bodies designed using the inventive process. The Examiner notes that a picture of a custom designed dump body, in use, was shown during the interview. The Examiner further notes that custom (point of use) designed dump bodies appear to be an entirely new market (or sub-market), and that these large dump bodies are very expensive items. In view of these facts, the Examiner attaches substantial weight to this secondary consideration, and will keep it in mind while examining this application.

22. Claim Rejections-35 USC § 112-first paragraph (Enablement), second (Indefinite)

23. The following is a quotation of the first paragraph of 35 U.S.C. 112: The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
24. The following is a quotation of the second paragraph of 35 U.S.C. 112: The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
25. **Claims 16, 18, 29, and 30 are rejected under 35 U.S.C. 112, first paragraph, as not enabled**, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, and **is further rejected under 35 U.S.C. 112, second paragraph, as being indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
26. Claim 16 (amended) states “**comparing** the three dimensional volumetric load model with the representative of the actual load collected at the anticipated point of use and **adjusting** the three dimensional volumetric load model as necessary such that the three dimensional volumetric load model substantially matches the representation of the actual load collected at the anticipated point of use”. The specification does not adequately describe this term. The specification does not describe any iterative design feedback loop whereby the model is “compared” against an actual load, and then “adjusted”.
27. Claim 18 (twice amended) states “**a generally rounded-off** conical three dimensional volumetric load model”. The specification does not adequately describe this term (see specification page 2 line 21 “generally conical shape”). The Examiner interprets this term simply as a cone.
28. Claim 29 (new) states “**lowest practical vertical location** for the center of gravity of the three dimensional model of the hauled material”. The specification does not adequately describe this term. Specifically, “practical” implies a complex analysis of a multi-criteria optimization problem, and no such analysis has been described.

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29. Claim 30 (new) states “allow the material to be loaded into the dump body from the **lowest practical vertical location**”. The specification does not adequately describe this term. Specifically, “practical” implies a complex analysis of a multi-criteria optimization problem, and no such analysis has been described.

Claim Rejections - 35 USC § 103

30. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

31. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

32. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- 33. Determining the scope and contents of the prior art.
- 34. Ascertaining the differences between the prior art and the claims at issue.
- 35. Resolving the level of ordinary skill in the pertinent art.
- 36. Considering objective evidence present in the application indicating obviousness or nonobviousness.

37. **Claims 1-15, 18-26, 28-37, 39-53, and 55-59 are rejected under 35 U.S.C. 103(a) as being unpatentable.**

38. **Claim 1 (twice amended) is rejected under 35 U.S.C. 103(a)** as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Inc., Product Division, Field Representative Information Release, N149F “769 Series B Truck,” 08/24/66, p. 1-21, and *In re Rinehart* (Legal Precedent for scaling).

39. Claim 1 (twice amended) is an independent claim with 8 limitations.

40. Note that Hagenbuch US Patent 5,887,914 has a different inventive entity (LeRoy G. Hagenbuch) than the inventive entity of the present application (Leroy G. Hagenbuch and Philip T. Brinkman). Thus, Hagenbuch ‘914 constitutes 102(e) type prior art that may be used in a 103(a) rejection. Additionally, note that the MPEP 706.02(k) exclusion of 102(e)

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prior art assigned to the same person does not apply because this application was filed before November 29, 1999 (on June 15, 1999).

41. (c)“**determining a desired location for a load center of gravity**” is disclosed by Hagenbuch ‘914 at FIG 14A Step 2 “Calculate correct load placement center of gravity”.
42. (d)“**determining a desired volumetric capacity for the body**” is disclosed by Hagenbuch ‘914 at FIG 14B Step 8c “Dose (sic) trial load volume match maximum desired load...?”
43. (e)“**initial line for a floor..front wall...inside body width**” is disclosed by Hagenbuch ‘914 at FIG 9A “body floor line”, FIG 9B “front slope line”, and FIG 10A “inside body width”.
44. (g)“**adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location...**” is disclosed by Hagenbuch ‘914 at FIG 14B Steps 8f “Too far forward” through Step 8m “Move Slope Components Rearward”.
45. (h)“**producing the body in accordance with the set of design parameters**” is disclosed by Hagenbuch ‘914 at FIG 14B Step 9 “DESIGN COMPLETED”.
46. Hagenbuch’914 does not appear to explicitly disclose the remaining limitations.
47. (a)“**determining an anticipated point of use for the vehicle**” is disclosed by Caterpillar Inc., Product Division, Field Representative Information Release, N149F “769 Series B Truck,” 08/24/66, Page 6 first full paragraph “While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B” and *In re Rinehart* (Legal Precedent for scaling).
48. *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states “mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled”. See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to design bodies at individual points of use, but this mere difference in scale does not appear to be patentable.

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49. (b) **“collecting data from the anticipated point of use”** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in limitation (a).
50. (f) **“developing a three dimensional volumetric model of a load to be carried in the body...”** is disclosed by Caterpillar Inc. (Release N149F), Page 6 first full paragraph “While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B.”
51. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), to modify Hagenbuch ‘914. One of ordinary skill in the art would have been motivated to do this to more accurately match the body design to the “loading techniques and material characteristics” by designing based on a smaller and more specific heaped load pattern data set.
52. Claim 2 depends from Claim 1 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
53. “design parameters of the body includes a position of the body floor and a position of body sidewalls” is disclosed by Hagenbuch ‘914 at FIG 9A “body floor line” and FIG 10A “inside body width”.
54. Claim 3 depends from Claim 2 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
55. **“position of the body floor includes a length of the floor”** is disclosed by Hagenbuch ‘914 at FIG 14B “Establish maximum overall body dimensions”.
56. Claim 4 depends from Claim 2 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
57. **“position of the body sidewalls includes a height of the sidewalls”** is disclosed by “Euclid Inc., Form 12-015 “Euclid R-85 Specifications”, 08/77 on Page 4 “the low loading height of 14-4” (4369 mm) allows sufficient clearance to cleanly deposit a full bucket load”.

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58. Claim 5 depends from Claim 4 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
59. **“distance between the respective sidewalls”** is disclosed by **Form 12-015 “Euclid R-85 Specifications,” 08/77** at Page 4 “14’-10” 4521 mm”.
60. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use “Euclid Inc., Form 12-015 “Euclid R-85 Specifications” and Caterpillar Inc., Product Division, Field Representative Information Release, N149F “769 Series B Truck,” 08/24/66, to modify Hagenbuch ‘914.
61. Claim 6 depends from Claim 2 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
62. **“position of the body front wall”** is disclosed by **Form 12-015 “Euclid R-85 Specifications,” 08/77** at Page 4 in the detailed dimensional drawings.
63. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use “Euclid Inc., Form 12-015 “Euclid R-85 Specifications” and Caterpillar Inc., Product Division, Field Representative Information Release, N149F “769 Series B Truck,” 08/24/66, to modify Hagenbuch ‘914.
64. Claim 7 depends from Claim 4 with one additional limitation, thus is rejected for the same reasons plus these additional reasons.
65. **“adjust the length of the body floor and the height of the body sidewalls to provide the lowest practical vertical location for the center of gravity”** is disclosed by Hagenbuch ‘914 at FIG 14A Step 6b “Dose (sic) trial load center of gravity match correct load center of gravity?” and alternately disclosed by Caterpillar Inc., Brochure AEO26730 “Caterpillar 769 Series B” at page 15 second paragraph “lower the center of gravity of the truck”.
66. Claim 8 depends from Claim 1, with one additional limitation.
67. **“data collected from the anticipated point of use includes angles of material repose of an actual load”** is disclosed by Caterpillar Inc., Product Division, Field Representative Information Release, N149F “769 Series B Truck,” 08/24/66, at Page 6 second paragraph “While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are

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actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B”.

68. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use RELEASE NO. N149F, TITLE 769 SERIES B TRUCK, DATE AUGUST 24, 1996 to modify Hagenbuch ‘914.

69. Claim 9 depends from Claim 8, with one additional limitation.

70. **“angles of material repose include a front angle of material repose, a rear angle of material repose and side angles of material repose”** is disclosed by Caterpillar Inc., Product Division, Field Representative Information Release, N149F “769 Series B Truck,” 08/24/66, at Page 6 second paragraph “While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B”. Note that this “1.7:1 heaped load pattern” indicates a specific (and constant) angle of repose for front, rear, and sides. Further note that this claim does not specify different angles of material repose. If different angles of material repose were claimed, then this claim would not be anticipated.

71. Claim 10 (amended) depends from Claim 9, with one additional limitation.

72. **the data collected from the anticipated point of use further includes a representation of an actual load carried in an existing vehicle body** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in Claim 1 (twice amended) limitation (a).

73. Claim 11 (amended) depends from claim 10, with one additional limitation.

74. **the data collected from the anticipated point of use includes angles of material repose and representations of corner voids present in the corners of a plurality of existing vehicles** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in Claim 1 (twice amended) limitation (a). Note the corner voids are the empty spaces between the load and the truck body. Thus, the voids are inherently defined by the representation of the load.

75. Claim 12 (amended) depends from claim 1, with one additional limitation.

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- 76. the data collected from the anticipated point of use includes a density of the load material** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in Claim 1 (twice amended) limitation (a). Note that “actual weight” and “load shapes” (load volumes) are inherently related by the density of the load material. Specifically, weight equals volume times density.
77. Claim 13 (amended) depends from claim 1, with one additional limitation.
- 78. the data collected from the anticipated point of use includes a method used for loading material into an existing vehicle body the data collected from the anticipated point of use includes a density of the load material** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in Claim 1 (twice amended) limitation (a). Note that “depending on loading techniques” inherently discloses both the material providing device (bucket or similar) and the material receiving device (vehicle body).
79. Claim 14 (twice amended) depends from claim 10, with one additional limitation.
- 80. developing the three dimensional volumetric load model to account for corner voids in the vehicle body** is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in Claim 1 (twice amended) limitation (a). Note the corner voids are the empty spaces between the load and the truck body. Thus, the voids are inherently defined by the representation of the load.
81. Claim 15 (amended) depends from claim 14, with one additional limitation.
- 82. the three dimensional volumetric load model is developed through a gradual incremental blending of the respective side angles of material repose to the front angle of material repose and a gradual incremental blending of the respective side angles of material repose to the rear angle of material repose through respective rounded corners of the three-dimensional model of the hauled material** is disclosed by the well known primitive shape of a cone. The Examiner takes official notice that it is well known in the art that granular material dropped in a large pile from a single fixed discharge point onto a flat surface forms a cone with a single angle of repose. Most children in a sandbox have witnessed this experiment. Thus, a conical load shape is well known. Note that this claim is disclosed by a simple cone because different angles of repose have not been required. If this

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claim were amended to require different angles of repose, then it would not be disclosed by a simple cone.

83. The Applicant is entitled to traverse the official notice according to MPEP § 2144.03.

However, MPEP § 2144.03 further states “See also *In re Boon*, 439 F.2d 724, 169 USPQ 231 (CCPA 1971) (a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice).” Specifically, *In re Boon*, 169 USPQ 231, 234 states “as we held in *Ahlert*, an applicant must be given the opportunity to challenge either the correctness of the fact asserted or the notoriety or repute of the reference cited in support of the assertion. We did not mean to imply by this statement that a bald challenge, with nothing more, would be all that was needed”. Further note that 37 CFR § 1.671(c)(3) states “Judicial notice means official notice”. Thus, a traversal by the Applicant that is merely “a bald challenge, with nothing more” will be given very little weight.

84. Claim 16 (amended) depends from claim 14, with one additional limitation.

85. This claim is has been rejected as not enabled, and as indefinite, but is not rejected against prior art.

86. Claim 17 (amended) depends from claim 15, with one additional limitation.

87. This claim is objected to as depending from a rejected claim, but is otherwise allowable because of “**changes in the angles of material repose**”. This clearly requires different angles of repose as a function of the orientation (for example, front angle of repose different from side angle of repose).

88. Claim 18 (twice amended) depends from claim 1, with one additional limitation.

89. “**a generally rounded-off conical three dimensional volumetric load model**” is disclosed by the well known primitive shape of a cone. The Examiner takes official notice that it is well known in the art that granular material dropped in a large pile from a single fixed discharge point onto a flat surface forms a cone with a single angle of repose. Most children in a sandbox have witnessed this phenomenon. Thus, a conical load shape is well known. Note that this claim is disclosed by a simple cone because different angles of repose have not been required. If this claim were amended to require different angles of repose, then it would not be disclosed by a simple cone. See claim 17 (amended).

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90. Claim 19 depends from Claim 1 with one new limitation, thus is rejected for the same reasons plus these additional reasons.

91. **“adjusting the set of design parameters to provide the lowest practical vertical location for the center of gravity”** is disclosed by Caterpillar Inc., Brochure AE026730 “Caterpillar 769 Series B,” Applicants believe available in 1967 at Page 15 second paragraph “The V-shaped bottom of the body also serves to lower the center of gravity of the truck, giving the 769B greater stability.

92. Claim 20 depends from Claim 1 with one new limitation, thus is rejected for the same reasons plus these additional reasons.

93. **“adjusting the set of design parameters to allow material to be loaded into the dump body from the lowest practical vertical location”** is disclosed by Caterpillar Inc., Brochure AE026730 “Caterpillar 769 Series B,” Applicants believe available in 1967 at Page 15 first paragraph “Body height is 9’8” (2946 mm) allowing more than a foot (305 mm) of clearance for loading by a Cat 988 Wheel Loader.”

94. **Claim 21 (new) is rejected under 35 U.S.C. 103(a)** as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Inc., Product Division, Field Representative Information Release, N149F “769 Series B Truck,” 08/24/66, p. 1-21, and *In re Rinehart* (Legal Precedent for scaling).

95. Claim 21 (new) is an independent claim, with 6 limitations.

96. (a) **“determining a desired location for a load center of gravity”** is disclosed by Hagenbuch ‘914 at FIG 14A Step 2 “Calculate correct load placement center of gravity”.

97. (b) **“determining a desired volumetric capacity for the body”** is disclosed by Hagenbuch ‘914 at FIG 14B Step 8c “Dose (sic) trial load volume match maximum desired load...?”

98. (c) **“initial line for a floor..front wall...inside body width”** is disclosed by Hagenbuch ‘914 at FIG 9A “body floor line”, FIG 9B “front slope line”, and FIG 10A “inside body width”.

99. (d) **“developing a three dimensional volumetric model of a load to be carried in the body...”** is disclosed by Caterpillar Inc. (Release N149F), Page 6 first full paragraph “While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are

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actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B.”

100. (e) **“adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location...”** is disclosed by Hagenbuch ‘914 at FIG 14B Steps 8f “Too far forward” through Step 8m “Move Slope Components Rearward”.
101. (f) **“producing the body in accordance with the set of design parameters”** is disclosed by Hagenbuch ‘914 at FIG 14B Step 9 “DESIGN COMPLETED”.
102. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), to modify Hagenbuch ‘914. One of ordinary skill in the art would have been motivated to do this to more accurately match the body design to the “loading techniques and material characteristics” by designing based on a smaller and more specific heaped load pattern data set.
103. Claim 22 (new) to claim 26 (new).
104. These claims do not introduce any new limitations, thus are rejected for the same reasons given above for the same limitations.
105. Claim 27 (new) depends from claim 21 (new), with 1 additional limitation.
106. **the data collected from the anticipated point of use includes a front angle of material repose, a rear angle of material repose and side angles of the material repose is not** rejected against any prior art, and would be allowable if it rolled up the limitations of the parent claim 21.
107. Claim 28 (new) depends from claim 21 (new), with 1 additional limitation.
108. **conical shape of an actual load** is disclosed by the well known primitive shape of a cone. The Examiner takes official notice that it is well known in the art that granular material slowly dropped in a large pile from a single fixed discharge point onto a flat surface forms a cone with a single angle of repose. Most children in a sandbox have witnessed this phenomenon. Thus, a conical load shape is well known. Note that this claim is disclosed by a simple cone because different angles of repose have not been required. If this claim were amended to require different angles of repose, then it would not be disclosed by a simple cone. See claim 17 (amended).

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109. Claim 29 (new) depends from claim 21 (new), with 1 additional limitation.
110. **lowest practical vertical location for the center of gravity of the three dimensional model of the hauled material** is disclosed by Caterpillar Inc., Brochure AE026730 "Caterpillar 769 Series B," Applicants believe available in 1967 at Page 15 second paragraph "The V-shaped bottom of the body also serves to lower the center of gravity of the truck, giving the 769B greater stability", and is disclosed by official notice. It is well known in the art that a low center of gravity is more stable (if the other parameters remain constant), and thus preferable for vehicles.
111. Claim 30 (new) depends from claim 21 (new), with 1 additional limitation.
112. **allow the material to be loaded into the dump body from the lowest practical vertical location** is disclosed by Caterpillar Inc., Brochure AE026730 "Caterpillar 769 Series B," Applicants believe available in 1967 at Page 15 first paragraph "Body height is 9'8" (2946 mm) allowing more than a foot (305 mm) of clearance for loading by a Cat 988 Wheel Loader."
113. **Claim 31 (new) is rejected under 35 U.S.C. 103(a)** as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Official Notice (cones).
114. Claim 31 (new) is an independent claim with 6 limitations.
115. (a) **"determining a desired location for a load center of gravity"** is disclosed by Hagenbuch '914 at FIG 14A Step 2 "Calculate correct load placement center of gravity".
116. (b) **"determining a desired volumetric capacity for the body"** is disclosed by Hagenbuch '914 at FIG 14B Step 8c "Dose (sic) trial load volume match maximum desired load...?"
117. (c) **"initial line for a floor..front wall...inside body width"** is disclosed by Hagenbuch '914 at FIG 9A "body floor line", FIG 9B "front slope line", and FIG 10A "inside body width".
118. (e) **"adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location..."** is disclosed by Hagenbuch '914 at FIG 14B Steps 8f "Too far forward" through Step 8m "Move Slope Components Rearward".
119. (f) **"producing the body in accordance with the set of design parameters"** is disclosed by Hagenbuch '914 at FIG 14B Step 9 "DESIGN COMPLETED".

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120. Hagenbuch'914 does not appear to expressly disclose the remaining limitation.
121. (d) **“generally rounded-off three dimensional volumetric load model”** is disclosed by the well known primitive shape of a cone. The Examiner takes official notice that it is well known in the art that granular material slowly dropped in a large pile from a single fixed discharge point onto a flat surface forms a cone with a single angle of repose. Most children in a sandbox have witnessed this phenomenon. Thus, a conical load shape is well known. Note that this claim is disclosed by a simple cone because different angles of repose have not been required. If this claim were amended to require different angles of repose, then it would not be disclosed by a simple cone. See claim 17 (amended) and claim 28 (new).
122. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Official Notice (cones) to modify Hagenbuch'914 in order to accurately model loads for granular materials. Note that modern CAD makes the volumetric and center of gravity calculations for truncated cones (truncated by intersections with the dump body) more feasible, rather than being limited to the flat planes of the old standards.
123. Claims 32 (new) to claim 36 (new).
124. These claims do not introduce any new limitations, thus are rejected for the same reasons given above for the same limitations.
125. Claim 37 (new) depends from claim 31 (new), with 1 additional limitation.
126. **the three dimensional volumetric load model is developed through a gradual incremental blending of the respective side angles of material repose to the front angle of material repose and a gradual incremental blending of the respective side angles of material repose to the rear angle of material repose through respective rounded corners of the three-dimensional model of the hauled material** is disclosed by the well known primitive shape of a cone. The Examiner takes official notice that it is well known in the art that granular material dropped in a large pile from a single fixed discharge point onto a flat surface forms a cone with a single angle of repose. Most children in a sandbox have witnessed this experiment. Thus, a conical load shape is well known. Note that this claim is disclosed by a simple cone because different angles of repose have not been required. If this claim were amended to require different angles of repose, then it would not be disclosed by a simple cone.

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127. Claim 38 (new) depends from claim 31 (new), with 1 additional limitation.
128. This claim is objected to as depending from a rejected claim, but is otherwise allowable because of **“changes in the angles of material repose”**. This clearly requires different angles of repose as a function of the orientation (for example, front angle of repose different from side angle of repose).
129. **Claim 39 (new) is rejected under 35 U.S.C. 103(a)** as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Release N149F and *In re Rinehart* (Legal Precedent for scaling).
130. Claim 31 (new) is an independent claim with 6 limitations.
131. (a) **“determining a desired location for a load center of gravity”** is disclosed by Hagenbuch ‘914 at FIG 14A Step 2 “Calculate correct load placement center of gravity”.
132. (b) **“determining a desired volumetric capacity for the body”** is disclosed by Hagenbuch ‘914 at FIG 14B Step 8c “Dose (sic) trial load volume match maximum desired load...?”
133. (c) **“initial line for a floor..front wall...inside body width”** is disclosed by Hagenbuch ‘914 at FIG 9A “body floor line”, FIG 9B “front slope line”, and FIG 10A “inside body width”.
134. (e) **“adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location...”** is disclosed by Hagenbuch ‘914 at FIG 14B Steps 8f “Too far forward” through Step 8m “Move Slope Components Rearward”.
135. (f) **“producing the body in accordance with the set of design parameters”** is disclosed by Hagenbuch ‘914 at FIG 14B Step 9 “DESIGN COMPLETED”.
136. Hagenbuch ‘914 does not appear to expressly disclose the remaining limitation.
137. (d) **“three dimensional volumetric model of a load...using data collected from an anticipated point of use”** is disclosed by Caterpillar Release N149F Page 6 first full paragraph “While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B” and *In re Rinehart* (Legal Precedent for scaling).

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138. *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states “mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled”. See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to design bodies at individual points of use, but this mere difference in scale does not appear to be patentable.
139. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Release N149F and *In re Rinehart* (Legal Precedent for scaling) to modify Hagenbuch’914 in order to accurately model loads for variations in loading techniques and material characteristics.
140. Claims 40 (new) to claim 43 (new).
141. These claims do not introduce any new limitations, thus are rejected for the same reasons given above for the same limitations.
142. **Claim 44 (new) is rejected under 35 U.S.C. 103(a)** as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Release N149F and *In re Rinehart* (Legal Precedent for scaling) and *In re Larson* (Legal Precedent for eliminating an element).
143. Claim 44 (new) is an independent claim with 6 limitations.
144. (a)“**determining a desired location for a load center of gravity**” is disclosed by Hagenbuch ‘914 at FIG 14A Step 2 “Calculate correct load placement center of gravity”.
145. (b)“**determining a desired volumetric capacity for the body**” is disclosed by Hagenbuch ‘914 at FIG 14B Step 8c “Dose (sic) trial load volume match maximum desired load...?”
146. (c)“**initial line for a floor..front wall...inside body width**” is disclosed by Hagenbuch ‘914 at FIG 9A “body floor line”, FIG 9B “front slope line”, and FIG 10A “inside body width”.

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147. (e) **“adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location...”** is disclosed by Hagenbuch ‘914 at FIG 14B Steps 8f “Too far forward” through Step 8m “Move Slope Components Rearward”.
148. (f) **“producing the body in accordance with the set of design parameters”** is disclosed by Hagenbuch ‘914 at FIG 14B Step 9 “DESIGN COMPLETED”.
149. Hagenbuch ‘914 does not appear to explicitly disclose the remaining limitations.
150. (d) **“three dimensional volumetric model of a load...using data collected from an anticipated point of use...load plateau at the top of the three dimensional volumetric load model”** is disclosed by Caterpillar Release N149F, and *In re Rinehart* (Legal Precedent for scaling), and *In re Larson* (Legal Precedent for eliminating an element).
151. The “three dimensional volumetric load” is disclosed by Caterpillar Release N149F Page 6 first full paragraph “While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B”.
152. The “using data collected from an anticipated point of use” is disclosed by *In re Rinehart* (Legal Precedent for scaling). *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states “mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled”. See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to design bodies at individual points of use, but this mere difference in scale does not appear to be patentable.
153. The “load plateau at the top of the three dimensional volumetric load model” is disclosed by *In re Larson* (Legal Precedent for eliminating an element). *In re Larson*, 340 F.2d 965, 144 USPQ 347, 350 (CCPA 1965) states “If this additional features is not desired, it would seem a matter of obvious choice to eliminate it and the function it serves”. See MPEP 2144.04(II)(A) “Omission of an Element and Its Function Is Obvious If the Function of the

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Element Is Not Desired". In this limitation, the "load plateau" is a horizontal plane cutting off the top portion of the volumetric load model (truncation). Thus, the top portion of three dimensional volumetric load model is eliminated, along with its associated volume and mass (volume and mass are the functions that the top portion serves).

154. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling) and *In re Larson* (Legal Precedent for eliminating an element) to modify Hagenbuch '914. One of ordinary skill in the art would have been motivated to do this to more accurately match the body design to the "loading techniques and material characteristics" by designing based on a smaller and more specific heaped load pattern data set, and to truncate the top of the model to more accurately match the actual load. Again, note that improvements in CAD make it more economically feasible to use slightly more complex models to more accurately model real loads.

155. Claims 45 (new) to claim 51 (new).

156. These claims do not introduce any new limitations, thus are rejected for the same reasons given above for the same limitations.

157. **Claim 52 (new) is rejected under 35 U.S.C. 103(a)** as being unpatentable over Hagenbuch US Patent 5,887,914 in view of Caterpillar Inc., Product Division, Field Representative Information Release, N149F "769 Series B Truck," 08/24/66, p. 1-21, and *In re Rinehart* (Legal Precedent for scaling).

158. Claim 52 (new) is an independent claim with 8 limitations.

159. Note that Claim 52 (new) uses "representative point of use", unlike "anticipated point of use" in Claim 1 (twice amended). However, the same art applies. "Representative point of use" implies a slightly larger scale than "anticipated point of use".

160. (c) **"determining a desired location for a load center of gravity"** is disclosed by Hagenbuch '914 at FIG 14A Step 2 "Calculate correct load placement center of gravity".

161. (d) **"determining a desired volumetric capacity for the body"** is disclosed by Hagenbuch '914 at FIG 14B Step 8c "Dose (sic) trial load volume match maximum desired load...?"

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162. (e)“**initial line for a floor..front wall...inside body width**” is disclosed by Hagenbuch ‘914 at FIG 9A “body floor line”, FIG 9B “front slope line”, and FIG 10A “inside body width”.
163. (g)“**adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location...**” is disclosed by Hagenbuch ‘914 at FIG 14B Steps 8f “Too far forward” through Step 8m “Move Slope Components Rearward”.
164. (h)“**producing the body in accordance with the set of design parameters**” is disclosed by Hagenbuch ‘914 at FIG 14B Step 9 “DESIGN COMPLETED”.
165. Hagenbuch ‘914 does not appear to explicitly disclose the remaining limitations.
166. (a)“**determining an representative point of use for the vehicle**” is disclosed by Caterpillar Inc., Product Division, Field Representative Information Release, N149F “769 Series B Truck,” 08/24/66, Page 6 first full paragraph “While field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B” and *In re Rinehart* (Legal Precedent for scaling).
167. *In re Rinehart*, 531 F.2d 1048, 1953, 189 USPQ 143, 148 (CCPA 1976) states “mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled”. See MPEP 2144.04(IV)(A). Similarly, mere scaling down of the data set size (capable of being scaled down) would not establish patentability. This is particularly true here because Caterpillar specifically discloses the variations in field weight distribution with loading techniques and material characteristics. Improvements in CAD now apparently make it economically feasible to design bodies at individual points of use, but this mere difference in scale does not appear to be patentable.
168. (b)“**collecting data from the representative point of use**” is disclosed by Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), as discussed above in limitation (a).
169. (f)“**developing a three dimensional volumetric model of a load to be carried in the body...**” is disclosed by Caterpillar Inc. (Release N149F), Page 6 first full paragraph “While

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field weight distribution will vary, depending upon loading techniques and material characteristics, continuous analysis of actual weight studies, indicates normal load shapes are actually closer to a 1.7:1 heaped load pattern. Caterpillar has thus adopted the 1.7:1 heaped load shape to calculate published figures for the 769B.”

170. **At the time** the invention was made, it would have been obvious to a person of ordinary skill in the art to use Caterpillar Inc. (Release N149F) and *In re Rinehart* (Legal Precedent for scaling), to modify Hagenbuch‘914. One of ordinary skill in the art would have been motivated to do this to more accurately match the body design to the “loading techniques and material characteristics” by designing based on a smaller and more specific heaped load pattern data set.

171. Claims 53 (new).

172. This claim does not introduce any new limitations, thus is rejected for the same reasons given above for the same limitations.

173. Claim 54 (new) depends from claim 52 (new), with 1 additional limitation.

174. This claim is objected to as depending from a rejected claim, but is otherwise allowable because of “**angles of material repose of an actual load carried in an existing vehicle body**”. Note that the plural “angles” explicitly requires measurement of more than one angle, and in the context of the specification implicitly requires front, left, rear, and right angles to be measured.

175. Claims 55 (new) to claim 59 (new).

176. These claims do not introduce any new limitations, thus are rejected for the same reasons given above for the same limitations.

177. **MOTIVATION FOR ALL DEPENDENT CLAIMS**

178. At the time of the invention, one of ordinary skill in the art would have been motivated to begin with Hagenbuch US Patent 5,887,914 for the fundamentals of volumetric and center of gravity dump body design, then look to industry literature from the industry leading manufacturer (Caterpillar Inc., Release N149F) for factors that affect the center of gravity (loading techniques and material characteristics), then look to basic geometry for primitive shapes that more accurately represent the load (cones, and truncated cones), then look to *In re Rinehart* (Legal Precedent for scaling) to more accurately represent the loads by

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developing models based on smaller (and more specific) sets of data, then look to *In re Larson* (Legal Precedent for eliminating an element) to truncate the tops of the load models to more accurately represent the loads.

179. Note that Caterpillar Inc., Release N149F explicitly states that it is a gross approximation of many measurements, and clearly the sharp edges of the planar load model are an accepted (although undesired) mathematical simplification from the old days when center of gravity calculations were made by slide rule. Thus, limitations related to making customized “point of use” models, or to “rounding edges” stem merely from new economic feasibility due to the advanced power of modern CAD programs, and are not patentable.

Patentable material

180. At present, the Examiner believes that this application contains some potentially patentable material. Specifically, Applicant has observed that front, left, rear, and right side angles of repose are different for material dumped on a truck. This variation is counterintuitive. This variation appears to contradict the well known radially symmetric conical shape formed by sand slowly dropped from a single point in a child’s sandbox, or from sand dropped in an hourglass. Additionally, this variation (front, left, rear, right) is contradictory to industry standards for dump bodies, such as SAE J1363 NOV95. The reasons for this variation are complex, and beyond the scope of this examination.
181. The only hint that the Examiner can find of this type of variation/asymmetry is that said standard (SAE J1363 NOV95) uses two angles for the rear portion of the dump: a slope of $\frac{1}{2}$ for the top of the rear, and a slope of $\frac{1}{1}$ for the bottom of the rear. The reasoning for using these two angles for the two portions of the rear has been lost in time.
182. **The Examiner has found no prior art where the front angle is different from the side angle, and no legal precedent is applicable.**
183. Thus, the claims with limitations that require (or that may require based on data measurements) the front angle to be different from the side angle appear patentable.

Conclusion

184. Claims 17 (amended), 27 (new), 38 (new), and 54 (new) appear allowable if they incorporate the limitations of their respective parent claims.

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Response to Substantial Amendments-FINAL OFFICE ACTION

185. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
186. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication

187. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eduardo Garcia-Otero whose telephone number is 703-305-0857. The examiner can normally be reached on Monday through Thursday from 9:00 AM to 7:00 PM.
188. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin Teska, can be reached at (703) 305-9704. The fax phone numbers for this group are:
189. (703) 746-7238 --- for communications after a Final Rejection has been made;
190. (703) 746-7239 --- for other official communications; and

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191. (703) 746-7240 --- for non-official or draft communications.

192. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist, whose telephone number is (703) 305-3900.

* * * *



KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER